Recipe for nitrogen supply in line with requirements!

PIADIN®
The liquid manure refiner

SUSTAINIBILITY

Flexibility
Environment
Yield

The future of fertilisation.
With PIADIN® it is possible to spread organic fertilisers early on while it is still cool and wet without the risk of N-losses from the nitrate form. The addition of PIADIN® makes it possible to combine part applications. The delayed nitrate formation allows you to spread the complete quantities of liquid manure or digestate on a single date depending on the crop.

As PIADIN® stabilises the nitrogen in the root area as ammonium and there is hardly any risk of N-losses, liquid manure/digestate can be spread very early once the restricted period ends and viable, retentive soils are used. Of course the time of fertilisation must be matched to the plant requirement in line with good professional practice. The longer potential spreading period thus effected for all crops, but particularly for sugar beet and maize, increases flexibility and it makes it possible to unburden the storage space at an early stage.

PIADIN® increases the yield and improves the N-uptake (relative)

Average of the years 2003 to 2016, N-uptake cereals/oilseed rape through corn, silage maize dry matter yield; liquid manure application in early spring 120 – 150 kg N/ha (30 – 45 m³); test results from various locations

Using synergy effects

When using organic fertilisers, the combination with mineral fertilisers is recommended in order to provide sufficient sulfur as well as nitrogen.

PIADIN® in the stabilised fertilisation system for winter wheat

Test results LAF Cunnersdorf 2012 to 2016, n = 14; liquid manure or digestate fertilisation +/- PIADIN®, 40 m³/ha or 90 to 140 kg N/ha, mineral additional fertilisation; with PIAMON® 33-S or cereals-power® 60 to 120 kg N/ha; total average N-quantity 210 kg N/ha
PIADIN® delays the conversion from ammonium to nitrate. Conversion is, however, not inhibited completely at any point. As a result the plant can feed itself from both forms of nitrogen in line with requirements at all times. This guarantees optimal plant nutrition. That increases the yield and the quality: a perfect basis for high N-efficiency. Fertiliser applications can also be combined, thereby increasing flexibility.

✔️ Higher yield
✔️ Combination of liquid manure part applications breaks workload peaks
✔️ More flexibility due to possible earlier fertilising schedules
✔️ Greater nitrogen efficiency due to reduction of N-losses

Organic fertilisation
Make it successful with PIADIN®
Security for the environment.

Stabilisation with nitrification inhibitors – an important component for higher nitrogen efficiency and more environmental protection in agriculture.

**Better water quality**

The nitrification inhibitor PIADIN® can reduce nitrate displacement from the root area by up to 50%. Less nitrate in surface water and in the groundwater – a definite plus for nature.

**Better climate**

Nitrous oxide is a climate-relevant greenhouse gas and it is around 300 times more damaging than carbon dioxide. The nitrification inhibitor PIADIN® reduces nitrous oxide emissions by up to 75%. This makes a real contribution to climate protection.

**PIADIN® delays the conversion from ammonium to nitrate considerably**

![Graph showing NO₃⁻ concentration in soil solution (mg NO₃⁻/l) over days following fertiliser application.](image)

- unfertilised treatment
- fertilised, without PIADIN®
- fertilised, with PIADIN®

Laboratory experiment with slurry deposit (measurement in soil solution, 5 cm below slurry deposit)

**PIADIN® reduces N₂O emissions by up to 75 %**

![Bar chart showing nitrous oxide emissions (kg N/ha).](image)

- without PIADIN®
- fertilised, with PIADIN®

Nitrous oxide emissions (kg N/ha)

**Effect on root formation**

It has been scientifically proven that ammonium focused plant nutrition can lead to significantly more intensive lateral root formation. This effect is also utilized for ammonium stabilisation as a consequence of the PIADIN® application. Both the water and nutrient acquisition capacity of the plants are improved as a result of this.
PIADIN® is a brand product from SKW Stickstoffwerke Piesteritz and it is based on decades of research work. Following fertilisation with organic fertilisers, the ammonium nitrogen transforms into nitrate nitrogen fully in one to two weeks. Nitrate nitrogen is very mobile and the risk of nitrate leaching which is harmful to the environment – and also of denitrification losses – is high.

The effect of PIADIN® starts immediately after fertilisation. The conversion of the nitrogen from stable ammonium to the mobile nitrate form is delayed by six to ten weeks. Unlike nitrate nitrogen, ammonium nitrogen is exchangeably bound to clay-humus complexes, it cannot be washed out or displaced and it is available to plants in the root area at all times in line with requirements. The plant can feed itself from ammonium and nitrate at the same time. Luxury consumption is thereby avoided and overgrown crops prevented.

In the right place at the right time

Stabilised nitrogen remains available to plants and losses are small even during unfavorable weather conditions. Stabilised nitrogen is protected against displacement and nitrous oxide losses when it is wet. In the event of drought it is always available to the plants in the root area.

Advantages of ammonium nutrition

H⁺-ions are given off in the area close to the roots thanks to the uptake of ammonium. The pH value is reduced slightly. As a result phosphate and micro nutrients become more available and they are also available to the plant.
PIADIN® product characteristics

Nitrogen stabiliser for organic fertilisers
Liquid formulation of the combination of agents 1H-1,2,4 triazole and 3 methylpyrazole

Characteristic values
pH value: 6 – 7
Specific weight: approx. 1.27 kg/l
Start of crystallization: -20 °C
Color: yellowish
Dynamic viscosity (at 20 °C): 3.62 mPas

PIADIN® is a substance which is slightly harmful to water (WHC 1) and it is subject to the Ordinance on Hazardous Substances “Preparation containing ammonium nitrate – group D”. TRGS 511 (Technical Rules for Hazardous Substances) must be heeded. PIADIN® has no limitations in terms of environmental compatibility. Direct contact between the PIADIN® product and galvanised material must be avoided.

PIADIN® should be mixed in the liquid manure tank just prior to the application. A bypass can be used for vacuum tanks or it is also possible to dose directly into the suction hose. For pumping tanker trucks PIADIN® must be introduced prior to filling. This is particularly straightforward and precise with a dispenser system. The appliance performs precise dispense with a pump and an electronic flow meter. The dosing system makes using PIADIN® even easier and you can always be certain you are using the optimum quantity. PIADIN® can be applied to the area shortly before organic fertilisation and incorporated together with the organic fertiliser.

Mixing in the storage container is also possible. It is essential that mixing is thorough. Application must occur within two weeks. PIADIN® transport containers meet all requirements with the 20 liter canister, the 200 liter barrel and the 1,000 liter IBC container.

PIADIN® can be used with all organic fertilisers which contain high proportions of ammonium nitrogen or in which the nitrogen is mineralised quickly (e.g. manure, digestate, slurry, dry chicken manure or bone meal).

It becomes more and more beneficial to use PIADIN® as more and more nitrogen is spread in an application and the time period between the fertilisation and the greatest nutrient requirement becomes longer.

Special application of PIADIN® for Strip Till
Side dressing processes such as Strip Till provide the best opportunities for reducing ammonia losses. When slurry is injected in strips to a depth of 12 to 20 cm this prevents unpleasant odors and erosion losses of nutrients. Nitrous gas losses may, however, occur without PIADIN®.

PIADIN® can demonstrate its full effect in this process in particular. The ammonium depots in the soil are stabilised over long periods and they ensure a sustainable and balanced supply of nutrients. For use in the Strip Till process 3 l/ha of PIADIN® are adequate.

Further information is available on the Internet:
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